

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. A generator controller, comprising:

a processor;

5 an input capable of receiving signals from the generator;

an output capable of sending signals to the generator;

a display; and

a memory accessible by the processor, the memory containing (1) information corresponding to, the signals received from the generator, and (2) stored programming instructions operable by the processor to control the operation of a generator and to present on the display the information corresponding to the signals received from the generator.

10 2. The generator controller of claim 1, wherein the received signals comprise fault messages.

15 3. The generator controller of claim 1, wherein the received signals comprise binary encoded messages.

4. The generator controller of claim 1, wherein the information comprises a text message.

20 5. The generator controller of claim 4, wherein the text message comprises one or more words representative of the signals received from the generator.

6. The generator controller of claim 1, wherein the controller is mountable in a boat or recreational vehicle at a location remote from the generator.

25 7. The generator controller of claim 1, wherein the information comprises an icon.

8. The generator controller of claim 1, wherein the information comprises an audible alarm and wherein the controller further comprises a speaker configured to play the audible alarm.

25315  
CUSTOMER NUMBER



9. The generator controller of claim 1, wherein the memory further contains stored programming instructions operable by the processor to send to the generator, as a function of the signal received from the generator, a request for an additional signal.
10. The generator controller of claim 9, wherein the additional signal comprises a detailed fault message.
11. A generator controller, comprising:
- a processor;
- a display;
- an output capable of sending instructions to a generator; and
- 10       a memory accessible by the processor, the memory containing stored programming instructions operable by the processor to control the operation of a generator, monitor a parameter related to the duration of operation of the generator, and to present an indicator related to the parameter on the display.
12. The generator controller of claim 11, wherein the parameter comprises lifetime operation duration of the generator.
13. The generator controller of claim 11, wherein the parameter comprises duration since the last time the generator was serviced.
14. The generator controller of claim 11, wherein the indicator comprises a time period remaining until the generator is recommended to be serviced.
- 20       15. The generator controller of claim 14, wherein the time period remaining until the generator is recommended to be serviced is determined by subtracting a recommended operation duration from a current operation duration.
16. The generator controller of claim 15, wherein the recommended operation duration is adjustable by a user.
- 25       17. The generator controller of claim 16, wherein the memory contains stored programming instructions to cause the processor to present on the display a plurality of

25315  
CUSTOMER NUMBER

alternative generator types, and wherein the adjustment by the user is performed by selecting one generator type from the plurality of generator types.

18. A generator controller, comprising:

a processor;

5 an input capable of receiving signals from a generator;

an output capable of sending signals to the generator;

an input capable of receiving signals from an operating condition source; and

a memory accessible by the processor, the memory containing stored programming

instructions operable by the processor to control the operation of a generator and to inhibit

10 operation of the generator if a signal representative of an undesirable condition is received

from the operating condition source.

19. The generator controller of claim 18, wherein the operating condition source comprises a gas detector.

20. The generator controller of claim 19, wherein the gas comprises carbon dioxide or

15 carbon monoxide.

21. The generator controller of claim 18, wherein the operating condition source comprises a parking brake.

22. The generator controller of claim 18, wherein the operating condition source comprises a vehicle ignition and wherein the undesirable condition comprises the ignition 20 being switched to an on position.

23. The generator controller of claim 18, wherein the operating condition source comprises a building presence detector and wherein the undesirable condition comprises the presence of a building adjacent to a vehicle to which the generator is connected.

24. The generator controller of claim 18, wherein the operating condition source 25 comprises an external alternating current source, and wherein the undesirable condition comprises the presence of power available at the external alternating current source.

25315  
CUSTOMER NUMBER



25. The generator controller of claim 18, wherein the input is configured to receive signals from a plurality of operating condition sources and the stored programming instructions are configured to cause the processor to inhibit operation of the generator if a signal representative of an undesirable condition is received from one of the plurality of  
5 operating condition sources.

26. The generator controller of claim 18, wherein the input is configured to receive signals from a plurality of operating condition sources and the stored programming instructions are configured to cause the processor to inhibit operation of the generator as a function of the signals received from one or more of the plurality of operating condition  
10 sources.

27. A generator controller, comprising:  
a processor;  
an input capable of receiving an indication of a battery voltage;  
an output capable of sending signals to a generator configured to charge the battery;  
15 a memory accessible by the processor, the memory containing stored programming instructions operable by the processor to (1) determine a state of charge of the battery as a function of the received battery voltage over time and (2) to control the charging of the battery based on the battery state of charge.

28. The generator controller of claim 27, wherein the state of charge comprises an  
20 average of short term changes in the battery voltage.

29. The generator controller of claim 28, wherein the programming instructions cause the generator to charge the battery if the average of short term changes in the battery voltage are less than a value stored in the memory.

30. The generator controller of claim 28, wherein the programming instructions cause  
25 the generator to stop charging the battery if the average of short term changes in the battery voltage are greater than a value stored in the memory

31. The generator controller of claim 27, wherein the state of charge comprises an average of long term changes in the battery voltage.

32. The generator controller of claim 31, wherein the programming instructions cause the generator to charge the battery if the average of long term changes in the battery voltage  
5 are less than a value stored in the memory.

33. The generator controller of claim 31, wherein the programming instructions cause the generator to stop charging the battery if the average of long term changes in the battery voltage are greater than a value stored in the memory.

34. The generator controller of claim 27, wherein the state of charge is determined by  
10 evaluating at least two of lowest battery voltage, average discharge voltage, time the battery voltage has remained at stored voltage thresholds, time since last charge, average charge time, and maximum charge time.

35. The generator controller of claim 34, wherein the programming instructions cause the generator to charge the battery if the battery state of charge is too low.

15 36. The generator controller of claim 34, wherein the programming instructions cause the generator to stop charging the battery if the battery state of charge is full.

37. A generator controller, comprising:

a processor;  
an input capable of receiving an indication of a battery voltage;  
20 an output capable of sending signals to a generator configured to charge the battery;  
a real-time clock in signal communication with the processor; and  
a memory accessible by the processor, the memory containing stored programming instructions operable by the processor to (1) determine a state of charge of the battery and  
25 (2) to control the charging of the battery based on the battery state of charge and a time of day.



38. The generator controller of claim 37, wherein the time of day comprises an adjustable quiet time during which the generator may not be run.

39. The generator controller of claim 38, wherein the programming instructions further cause the processor to determine the state of charge of the battery at an adjustable time in advance of the quiet time and to operate the generator to charge the battery if the state of charge is determined to be too low.

40. The generator controller of claim 39, wherein the determination of whether the state of charge is too low is based upon historical battery usage information stored in the memory.

10 41. The generator controller of claim 39, wherein the determination of whether the state of charge is too low is based upon an adjustable value stored in the memory.

42. The generator controller of claim 37, wherein the time of day comprises an adjustable period prior to an expected battery usage period.

15 43. The generator controller of claim 42, wherein the programming instructions further cause the processor to determine the state of charge of the battery at the time of day and to operate the generator to charge the battery if the state of charge is determined to be too low.

20 44. The generator controller of claim 43, wherein the determination of whether the state of charge is too low is based upon historical battery usage information stored in the memory.

45. The generator controller of claim 43, wherein the determination of whether the state of charge is too low is based upon an adjustable value stored in the memory.

46. The generator controller of claim 43, wherein the usage period comprises a morning.

25 47. The generator controller of claim 43, wherein the usage period comprises an evening.

25315  
CUSTOMER NUMBER



48. A generator controller, comprising:

- a processor;
- an output capable of sending signals to a generator configured to charge the battery;
- a real-time clock in signal communication with the processor; and
- 5 a memory accessible by the processor, the memory containing stored programming instructions operable by the processor to (1) store a parameter related to the historical operation of the generator and (2) to control the operation of the generator based on the stored parameter.

49. The generator controller of claim 48, wherein the stored parameter comprises an  
10 operating duty cycle of the generator.

50. The generator controller of claim 49, wherein the stored programming causes the generator to run if the operating duty cycle is greater than a stored value.

51. The generator controller of claim 50, wherein the stored value is 70 percent.

52. The generator controller of claim 48, wherein the stored parameter comprises a  
15 number of start and stop requests in a particular time period.

53. The generator controller of claim 52, wherein the stored programming causes the generator to run if the number of start and stop requests is greater than a stored value.

54. The generator controller of claim 48, wherein the stored parameter comprises whether the generator has operated for a continuous minimum time within a particular time  
20 period.

55. The generator controller of claim 54, wherein the stored programming causes the generator to run if the generator has not operated for a continuous minimum time within the particular time period.

56. A generator controller, comprising:

- 25 a processor;
- an output capable of sending signals to a generator configured to charge the battery;



an input configured to receive signals from an external source related to one or more of a load or power supply; and

a memory accessible by the processor, the memory containing stored programming instructions operable by the processor to control the operation of the generator.

5        57. The generator controller of claim 56, wherein the received signal comprises an indication that a utility AC power source is present.

10      58. The generator controller of claim 57, wherein the generator controller is connectable to a generator/utility power transfer switch, and further wherein the stored programming instructions cause the switch to operate such that power is supplied to the battery from the utility AC power source and not from the generator.

15      59. The generator controller of claim 57, wherein the battery is connected to an inverter and the generator controller is connectable to an inverter transfer switch, and further wherein the stored programming instructions cause the inverter transfer switch to operate such that power is supplied to load from the utility AC power source and not from the inverter.

60. The generator controller of claim 56, wherein the external source comprises an inverter connected to the battery.

61. The generator controller of claim 60, wherein the received signal is indicative of whether the inverter is capable of handling a load connected to the inverter.

20      62. The generator controller of claim 60, wherein the stored programming instructions cause processor to (1) determine whether the inverter is capable of handling a load connected to the inverter and (2) to cause the generator to run if the inverter is not capable of handling the load connected to the inverter.

63. An enclosure for an electronic device, comprising:

25      a housing having an opening and defining an interior space configured to receive an electronic component;

25315  
CUSTOMER NUMBER



a metal panel mounted to substantially enclose the opening; and  
a magnetic panel magnetically removably attached to the metal panel.

64. The enclosure of claim 63, wherein the magnetic panel comprises a first side facing toward the metal panel and a second side facing away from the metal panel, and  
5 further comprising an indicia attached to the second side.

65. The enclosure of claim 64, wherein the indicia is formed on an additional layer of material attached to the second side of the magnetic panel.

66. The enclosure of claim 63, wherein the electronic component comprises a printed circuit board.

10 67. The enclosure of claim 63, wherein the electronic component comprises one or more of a display or a switch.

68. The enclosure of claim 67, wherein the metal panel and the magnetic panel are substantially the same size and further wherein each comprise one or more openings that are oriented such that the display or switch are accessible through the one or more openings.

15 69. The enclosure of claim 63, wherein the electronic component comprises a display and wherein the metal panel and the magnetic panel each comprise an opening that is oriented such that the display is visible through the one or more openings.

70. The enclosure of claim 69, further comprising a layer of translucent material within the opening.

25315  
CUSTOMER NUMBER

- 41 -

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